

REMARKS

In the Office Action of February 5, 2009, claims 1-3, 5, 6, and 15 were rejected under 35 U.S.C. § 102(b) as anticipated by Kawai et al. (USPN 5,675,173). Claim 4 was rejected under 35 U.S.C. § 103(a) as unpatentable over Kawai et al. in view of Joy et al. (USPN 4,454,647). Reconsideration and allowance of the claims in light of the amendments and arguments herein are respectfully requested.

Amended Claim 1

Claim 1, as amended, provides:

A semiconductor component with trench isolation for defining active regions in a semiconductor substrate, the trench isolation comprising:

a deep isolation trench with a first covering insulation layer below a surface of the semiconductor substrate and a second covering insulation layer over the first covering insulation layer and above the surface of the semiconductor substrate, a side wall insulation layer, an electrically conductive filling layer, which is electrically connected to a predetermined doping region of the semiconductor substrate in a bottom region of the isolation trench, and wherein the first covering insulation layer is over a top surface of the electrically conductive filling layer; and

further comprising:

a trench contact, which comprises:

a deep contact trench with a side wall insulation layer and an electrically conductive filling layer[,]] which is ~~likewise~~ electrically, contact-connected ~~connected~~ to the predetermined doping region of the semiconductor substrate in a bottom region of the contact trench;

a trench contact insulation layer above a surface of the electrically conductive filling layer; and

a contact opening through the trench contact insulation layer and in contact with a top the surface of the electrically conductive filling layer, and wherein a composition of the electrically conductive filling layer that is electrically, contact-connected to the predetermined doping region of the semiconductor substrate in a bottom region of the contact trench is the same as a composition of the electrically conductive filling layer having a top surface in contact with the contact opening.

Support for the amendments is at least as follows:

- “wherein the first covering insulation layer is over a top surface of the electrically conductive filling layer” (FIG. 1N; ¶ 34)
- “a deep contact trench with a side wall insulation layer and an electrically conductive filling layer which is electrically, contact-connected to the predetermined doping region of the semiconductor substrate in a bottom region of the contact trench” (FIGs. 1D – 1N; ¶ 28)
- “a contact opening through the trench contact insulation layer and in contact with a top surface of the electrically conductive filling layer” (FIG. 1N; ¶ 38)
- “wherein a composition of the electrically conductive filling layer that is electrically, contact-connected to the predetermined doping region of the semiconductor substrate in a bottom region of the contact trench is the same as a composition of the electrically conductive filling layer having a top surface in contact with the contact opening” (FIGs. 1D and 1N; ¶¶ 28, 38, 70)

No new matter has been added.

Kawai et al. does not disclose these claimed features. First, Kawai et al. discloses that the covering insulation layer (6) that is below the surface of the semiconductor substrate is below, not over, the top surface of the electrically conductive filling layer. Applicants claim “wherein the first covering insulation layer is over a top surface of the electrically conductive filling layer.” For at least this reason, claim 1 is believed allowable. Applicants respectfully request withdrawal of the rejection of claim 1 and its dependent claims, 2-6 and 15.

Second, Kawai et al. does not disclose that the electrically conductive filling layer is in contact with both the predetermined doping region of the semiconductor substrate and the contact opening. Kawai et al. discloses a first material (9) in contact with the opening (12), and a second, different material (7) in contact with the substrate (1). For at least these additional reasons, claim 1 is believed allowable. Applicants respectfully request withdrawal of the rejection of claim 1 and its dependent claims, 2-6 and 15.

Applicants respectfully request the allowance of claims 1-6 and 15.

CONCLUSION

Therefore, in view of the above remarks, we respectfully submit that this application is in condition for allowance and such action is earnestly requested.

If for any reason the Examiner is not able to allow the application, he is requested to contact the Applicants' undersigned attorney at (312) 321-4200.

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